



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/573,694

06/19/2006

Juliana G. Serafin

62397A

7169

109 7590 10/28/2008

The Dow Chemical Company  
Intellectual Property Section  
P.O. Box 1967  
Midland, MI 48641-1967

EXAMINER

ZIMMER, ANTHONY J

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

10/28/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/573,694	<b>Applicant(s)</b> SERAFIN ET AL.	
	<b>Examiner</b> ANTHONY J. ZIMMER	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 8/8/2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 4-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 4-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/7/2008</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The listing of references in the Search Report(s) (cited in the IDS) is not considered to be an information disclosure statement (IDS) complying with 37 CFR 1.98. 37 CFR 1.98(a)(2) requires a legible copy of: (1) each foreign patent; (2) each publication or that portion which caused it to be listed; (3) for each cited pending U.S. application, the application specification including claims, and any drawing of the application, or that portion of the application which caused it to be listed including any claims directed to that portion, unless the cited pending U.S. application is stored in the Image File Wrapper (IFW) system; and (4) all other information, or that portion which caused it to be listed. In addition, each IDS must include a list of all patents, publications, applications, or other information submitted for consideration by the Office (see 37 CFR 1.98(a)(1) and (b)), and MPEP § 609.04(a), subsection I. states, "the list ... must be submitted on a separate paper." Therefore, the references cited in the Search Reports have not been considered. Applicant is advised that the date of submission of any item of information or any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the IDS, including all "statement" requirements of 37 CFR 1.97(e). See MPEP § 609.05(a).

***Claim Rejections - 35 USC § 102/103***

The text of those sections of Title 35, U.S. Code not included here in this action can be found elsewhere in this Office action.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4-9, and 19-22 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Buffum '824.

In regard to claims 1 and 20-22, Buffum teaches a catalyst for the manufacture of ethylene oxide (an alkylene oxide) by the vapor phase epoxidation of ethylene oxide. See column 5, lines 55-63. In particular the catalyst comprises silver and efficiency-enhancing promoters including alkali metals, rhenium, and a co-promoter (see column 4, line 66 – column 5, line 17) supported on a refractory solid support (alumina) (see column 2, lines 15-41) containing 0.1-10% zirconium silicate (this is the composition before firing). See column 2, lines 59 – column 3, line 18; and Table 5, Carriers J and R-W. Though Buffum is silent in regard to the composition comprising zirconium silicate in the final product, the carriers are fired at temperatures in the range of 1393-1413°C (see Table 4), temperatures well below the temperature of decomposition of zircon to zirconia (1540°C see instant page 8, lines 27-29). Thus the end composition of zircon in the carrier after firing would be similar to the starting composition, and would at very least meet the small amounts required by claims 1 and 20-22.

In regard to claims 4-6, Buffum teaches 5-20 wt % silver. See column 5, lines 18-21.

In regard to claims 7-9, Buffum teaches lithium sulfate and lithium nitrate (alkali metal compound and member of a redox-half reaction pair), and ammonium perrhenate (an oxyanion of an element (rhenium) having an atomic number and in a group within the ranges required by claim 7). See column 9, line 23- column 10, line 55.

In regard to claim 19, Buffum teaches a solid support having a surface area of at least  $0.5 \text{ m}^2/\text{g}$  and a pore volume of at least  $0.5 \text{ cc/g}$ , see Carriers R and U-W in Table 4. Buffum does not teach the median pore diameter. However, since the surface area, pore volume, and composition (see above) of these supports are substantially similar to instant invention, the other properties of the solid support of Buffum would also be substantially similar, and would thus have a median pore diameter falling within the range required by the claim. Furthermore, Carrier A is found to have a median pore diameter of 4.6 microns, which falls in the range of the claim. See Column 7, line 55 and MPEP 2112.01. Since Carriers R and U-W are similar to Carrier A in composition and have a similar process of making; the median pore diameters of carriers R and U-W would also be similar to that of Carrier A and fall in the range required by the claim.

Claims 10 and 14 are rejected under 35 U.S.C. 102(b) as anticipated by Buffum '824 or, in the alternative, under 35 U.S.C. 103(a) as obvious over Buffum '824 in view of Weber '134.

In regard to claim 10, Buffum teaches a catalyst support containing at least 95% alpha alumina exclusive of the zirconium component (see Carrier J on Table 5, wherein the zirconia and zirconium silicate make up the zirconium component and exclusive of the zirconium component 99.5% of the support is alpha alumina or Carrier U with 99.3% alpha alumina). [For Carrier J, On the basis of 100 g, alumina comprises 98.42 g and the non-zirconium component is 0.47 g thus alumina comprises  $(98.42)/(98.42 + 0.47) * 100\% = 99.5\%$ .] .

In regard to claim 14, Buffum teaches a catalyst support containing at least 99% alpha alumina exclusive of the zirconium component (see Carriers R and S on Table 5, respectively wherein exclusive of the zirconium component 99.6% and 99.3% of the support is alpha alumina). [Calculated similar to the calculations above.] Carriers R and S of Table 5 also contain no alkaline earth metal other than calcium.

The above cited percentages of alpha alumina do not take impurities into account. However, typically impurities in alpha alumina comprise a proportion of the catalyst on the order of parts per million. See evidentiary document, Thorsteinson '140, Table 2. Thus, the percentage of impurities in the alumina of Buffum would not cause the percentage of alpha alumina to be out of the ranges required by the claims.

In the event that the impurities do cause the percentage of alumina to be sufficiently low as to not fall in the range required by the claim, it would have been obvious to one of ordinary skill in the art to modify Buffum with Weber because Weber teaches an alpha alumina like that used in Buffum, and in particular teaches using as pure a carrier as possible in order minimize detrimental reactions involving impurities.

Art Unit: 1793

See column 1, lines 16-25. Thus it would have been obvious to one of ordinary skill in the art to use the purest alpha alumina possible (near 100% and in the range of the claims), or to purify an alpha alumina, in order to affect the predictable result of minimizing detrimental reactions involving the impurities.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 11-13 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buffum '824 in view of Weber '134.

In regard to claims 10-12, see above 102/103 rejection for the limitations of claim 10, Carriers J and U-W of Table 5 also contain no calcium additive.

In regard to claim 13, see above 102/103 rejection for the limitations of claim 10, Carriers R-T of Table 5 also do not contain any alkaline earth metal additive other than calcium.

In regard to claims 15-16, see above 102/103 rejection for the limitations of claim 14. Carriers J and U-W of Table 5 also contain no calcium and meet the limitation of claim 14.

In regard to claims 17, see above 102/103 rejection for the limitations of claim 14. Carriers R and S of Table 5 also contain no alkaline earth metal additive other than calcium.

Buffum is silent in regard to the impurity content of the alpha alumina. However, it would have been obvious to one of ordinary skill in the art to modify Buffum with Weber because Weber teaches an alpha alumina like that used in Buffum, and in particular teaches using as pure a carrier as possible in order minimize detrimental reactions involving impurities. See column 1, lines 16-25. Thus it would have been obvious to one of ordinary skill in the art to use the purest alpha alumina possible (with near 0% impurities (of any alkaline earth metal) and falling in the ranges of the claims), or to purify an alpha alumina, in order to affect the predictable result of minimizing detrimental reaction involving the impurities.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Buffum '824 (alternatively in view of Weber as applied to claim 14 above) further in view of Thorsteinson '140.

Buffum (and Weber) are silent in regard to the morphology required by the claim. In the event that the carrier of Buffum does not have the required morphology, it would have been obvious to one of ordinary skill in the art to modify Buffum in view of Thorsteinson because Thorsteinson teaches a silver catalyst supported on an alumina carrier used in the epoxidation of an olefin like the invention of Buffum. See abstract of Thorsteinson and column 8, lines 1-59. In particular, Thorsteinson teaches using a carrier comprising alumina that has [a particulate matrix of] lamellate or platelet-type (interlocking platelet) morphology. See column 8, lines 43-59. One of ordinary skill in the art would have found it obvious to substitute the alumina of Thorsteinson for the alumina of Buffum in order to affect the predictable result of forming an epoxidation catalyst of a silver catalyst on an alumina support.

### ***Response to Arguments***

Applicant's arguments filed 8/8/2008 have been fully considered but they are not persuasive.

Applicant argues that zirconium silicate would not be present in the final product because calcium and barium nitrates are used. This was found to be unpersuasive for the following reasons:

Claim 1 does not require a specific amount of zirconium silicate and only requires that "said zirconium component being present substantially as zirconium silicate." "Substantially" is a relative term which encompasses any non-zero amount. Claims 20-22 only require very small amounts of zirconium silicate (the largest being 0.3% by

Art Unit: 1793

weight). No evidence has been presented showing that zirconium silicate is not present in the product of Buffum, and attorney arguments cannot take the place of evidence in showing inoperability of prior art. See MPEP 716.01(c) and MPEP 2112.01.

Applicant submits that calcium nitrate would react to form calcium oxide which would then react with zirconium silicate to form zirconia starting at 1118°C. However, at such a temperature a complex between the calcium oxide and zirconium silicate forms (as described in the cited Blumenthal article), and thus the zirconium silicate is still in the form of zirconium silicate just complexed with calcium oxide. Applicant then claims that upon prior heating, free zirconia forms. The Blumenthal article cited to support applicant's argument discloses that zirconium silicate (in both its original form and also complexed with calcium oxide) is still present at 1415°C, a temperature higher than that used by Buffum. Thus, applicant fails to establish that zirconium silicate is not present in Buffum in at least the small amounts required by the claim. Applicant did not provide any evidence or argument in regard to barium nitrate. Also, it should be noted that Blumenthal does not take into account the presence of alumina that is present in Buffum.

Applicant submits that the lithium nitrate is not a member of a redox half reaction pair because the catalyst is not a catalyst to which NO is fed. However, this does not change the fact that lithium nitrate is a member of such a pair, the product claims do not require that NO be present in the composition. Moreover, the claims are drawn to a product, and not a process involving NO.

In response to applicant's arguments against the references individually (i.e. Weber and Thorsteinson), one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY J. ZIMMER whose telephone number is (571)270-3591. The examiner can normally be reached on Monday - Friday 7:30 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1793

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ajz

/Steven Bos/  
Primary Examiner, Art Unit 1793